942-152 Coronary Hemodynamics in Hypertrophic Cardiomyopathy: Intracoronary Doppler Observations

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Myocardial ischemia is a frequent occurence in hypertrophic cardiomyopathy (HCM); Although multiple mechanisms for ischemia have been proposed, a comprehensive study of the coronary hemodynamics has been difficult to obtain. Comprehensive coronary Doppler hemodynamics were obtained in 6 pts with HCM. Coronary blood flow velocities were measured in the mid-LAD. The following measures were made: average peak velocities (APV), average systolic and diastolic peak velocities (ASPV and ADPV), and diastolic/systolic ratio (DSVR = ADPV/ASPV). Coronary flow reserve (CFR) was measured after I.C. adenosine (36–42 μg) as the ratio of the maximum APV to the baseline APV. The results were compared with 15 controls with normal ventricular function and coronaries. *Results:* Compared to normal controls, pts with HCM have normal APV but markedly reduced systolic forward flow with many patients having systolic reversals of flow. Pts with HCM also have significantly reduced CFR.

	APV	ASPV	ADPV	DSVR	CFR
HCM n = 6	27 ± 4.8	3.6 ± 2.5*	39 ± 10	51 ± 32*	1.9 ± 0.4*
Normals n = 15	26 ± 2.4	14 ± 1.8	30 ± 2	2.1 ± 0.1	3.3 ± 0.2

*p < 0.05 vs normals

This study demonstrates that the coronary hemodynamics are altered in patients with HCM with marked blunting or reversal of systolic flow and reduced vasodilatory reserve that may contribute to myocardial ischemia. Systolic compression of the microcirculation may cause a "milking" effect with systolic reversals.

942-153 Regional Coronary Vasomotion and Distribution of Left Ventricular Hypertrophy in Hypertrophic Cardiomyopathy

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Abnormalities of the small intramural coronary arteries have been described previously in hypertrophic cardiomyopathy (HCM) and are thought to be the cause of angina through a reduction of the coronary flow reserve (CFR). There is lack of knowledge concerning epicardial coronary vasomotion, regional CFR and its relation to the distribution of hypertrophy. We performed invasive CFR measurements using intracoronary Doppler flow wire (FloWire®) and quantitative angiography before and after serial injections of Papaverine, the endothelium dependend vasodilator Substance P (SP) and atrial pacing in all three main coronary vessels in 11 patients with HCM (age 47.2 ± 6.4) without angiographic evidence of epicardial coronary artery disease. The distribution of hypertrophy was determined using mutliplane transesophageal echocardiography and 3D reconstruction (TomTec). In four equally spaced short axis cross sections maximal wall thickness was determined in four segments (anterior and posterior septum, anterior and posterior free wall).

Results: CFR was reduced in all 3 vessels with significant reduction in the LAD (2.2 ± 1.0) and RCX (1.9 ± 1.0) as compared to RCA (2.9 ± 0.9; $p < 0.05$). Maximal left ventricular hypertrophy was significantly larger in the LAD and RCX perfusion territory (18.9 ± 6 mm for anterior septum and 18.4 ± 5 mm for anterior free wall) as compared to the RCA perfusion territory (15.2 ± 5 mm for posterior free wall; $p < 0.05$). Epicardial coronary vasodilation determined before and after injection of SP and pacing and expressed as percent change in vessel diameter was normal in all coronary arteries (mean 14%, $p < 0.001$ as compared to baseline values).

Conclusion: In HCM the reduced CFR is related to the distribution of hypertrophy. Epicardial coronary vasomotion is not altered in the disease. Therefore, in HCM reduction of CFR is inhomogenous and limited to the resistance vessel level.

942-154 Fractional Velocity Reserve – A New Index for Stenosis Severity Assessment with Good Correlation to Fractional Flow Reserve

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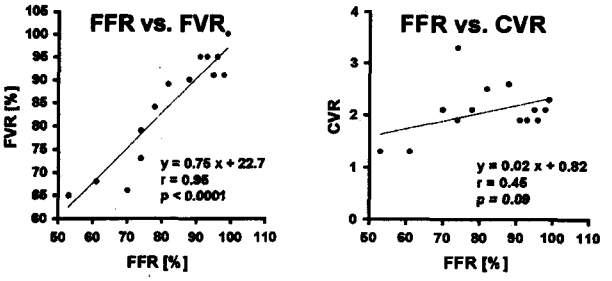
For coronary flow velocity reserve (CVR) based on intracoronary Doppler measurements a clear threshold value to discriminate the functional severity of a coronary stenosis does not exist. Instead, the concept of myocardial fractional flow reserve (FFR) based on intracoronary pressure measurements has been extensively validated. A FFR value below 0.75 reliably indicates a significant stenosis. In parallel to the concept of FFR, we have sought to establish a new concept of the fractional velocity reserve (FVR). FVR is calculated as ratio between distal CVR in the stenosed target vessel divided by the distal CVR in a nonstenotic reference vessel. In 12 patients FVR was determined in 15 target vessels using adenosine i.c. (FloWire, Cardiometrics) and correlated to the FFR (Pressure wire, Radi) in the target vessel.



Conclusion: FVR shows an excellent correlation to the values of FFR whereas the correlation of CVR with FFR is rather poor. FVR seems to be a promising new concept for the assessment of coronary stenosis severity and clinical decision making based on Doppler measurements.

943 Atherosclerotic Risk Factors

Monday, March 17, 1997, Noon–2:00 p.m.
Anaheim Convention Center, Hall E
Presentation Hour: 1:00 p.m.–2:00 p.m.

943-135 High Plasma Homocysteine is a Risk Factor for Vascular Complications of End Stage Renal Disease and Enhances the Adverse Effects of Smoking and Diabetes

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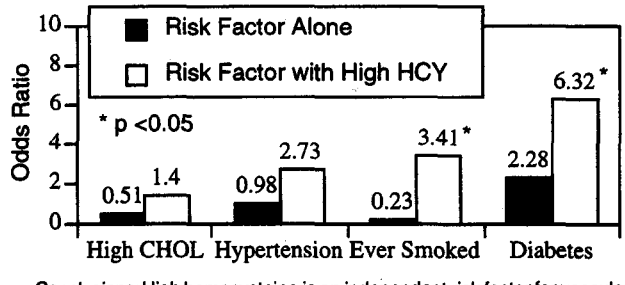
Background: Vascular complications are a major cause of mortality in end stage renal disease (ESRD) and are not entirely explained by traditional risk factors. High plasma homocysteine (HCY), also a risk factor for vascular disease, is often seen in ESRD.

Aims and Methods: To assess the role of homocysteine as a risk factor for vascular complications and its interactions with other risk factors, total plasma levels were determined in 176 ESRD patients (97 men and 79 women, mean age 56.3 ± 14.8 years and were then compared to healthy controls.

Results: Homocysteine was higher in cases than controls (26.6 ± 1.5 vs 10.1 ± 1.7 μmol/L, $p < 0.01$). A high homocysteine concentration independently increased the risk of vascular complications (OR 2.8; CI 1.3–5.9, $p < 0.01$) and also enhanced the risks associated with smoking and diabetes (see figure).



Conclusions: High homocysteine is an independent risk factor for vascular complications in ESRD patients and enhances the vascular risk associated with smoking and diabetes.

943-136 Homocysteine is Increased in Patients with Diffuse Atherosclerosis

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Homocysteine is a graded risk factor for the incidence of stroke and the degree of carotid atherosclerosis. The precise relations between homocysteine

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